F.C.C. 76-235

BEFORE THE
FEDERAL COMMUNICATIONS COMMISSION
WASHINGTON, D.C. 20554

Docket No. 19528

In the Matter of

PROPOSALS FOR NEW OR REVISED CLASSES OF INTERSTATE AND FOREIGN MESSAGE TOLL TELEPHONE SERVICE (MTS) AND WIDE AREA TELEPHONE SERVICE (WATS)

Memorandum Opinion and Order

(Adopted: March 12, 1976; Released: March 15, 1976)

BY THE COMMISSION: COMMISSIONERS LEE AND HOOKS CONCURRING IN THE RESULT.

1. In a First Report and Order herein, released November 7, 1975, 56 FCC 2d 593, the Commission established a registration program designed to allow users of the nationwide telephone network to connect terminal equipment other than PBXs, key telephone systems, main station telephones,[1] and coin telephones to the network without the need for carrier-supplied connecting arrangements, provided they comply with the standards incorporated in the registration program to protect the network from harm. The standards and registration procedures are contained in a new Part 68 and Part 2 of the Commission's Rules.

2. Petitions for reconsideration of various aspects of the First Report and Order were filed by the Bell System Companies (Bell), GTE Service Corporation (GTE), Continental Telephone Corporation, Rixon, Inc., Computer and Business Equipment Manufacturers Association (CBEMA), and Exxon Enterprises, Inc. (Exxon). We also received a "Petition for Amendment of Part 68 of FCC Rules" filed

[1] A final decision on the inclusion of PBXs, key telephone systems and mair station telephones in the registration program will be announced in the near future.

by Communication Certification Laboratory (CCL), and comments filed by T.A.D. Avanti, Inc., Gaines M. Crook and Associates, J. P. Neil, Interface Technology, Inc., Guardian Industries, Inc., and Phone Mate, Inc. Oppositions to one or more of the petitions for reconsideration were filed by Bell, GTE, CBEMA, Exxon, IBM, the Central Committee on Telecommunications of the American Petroleum Institute (API), General Data-Comm Industries, Inc., the Independent Data Communications Manufacturers Association, Inc. (IDCMA), the North American Telephone Association (NATA), and DASA Corporation. Replies were filed by Bell, GTE, Rixon, CBEMA, and Exxon. We also received a Memorandum filed by the United States Department of Justice opposing both Bell's and GTE's petitions for reconsideration.

3. In its reply to the various oppositions to petitions for reconsideration, filed January 22, 1976, Bell, for the first time, made substantive affirmative comments on and proposals for changes to the technical standards (Subpart D of Part 68 of the Commission's Rules) promulgated in the First Report and Order. In an Order released January 23, 1976 herein, Bell's late-filed proposals were treated as amendments to its earlier-filed petition for reconsideration and were accepted for filing. This Order also granted interested parties an opportunity to file comments on or oppositions to the Bell proposals by February 16, 1976, and allowed Bell to file a reply by February 26, 1976.

4. On February 13, 1976, the Commission released a Memorandum Opinion and Order herein (FCC 76-134) which acted on all aspects of the pleadings listed in paragraph 2 above except insofar as they related to technical standards. In view of Bell's late-filed proposals for changes to the technical standards, and the comments thereon, which had not yet been filed, the Commission reserved reconsideration of the technical standards for a later order (*see* paragraph 25 of our February 13, 1976 Memorandum Opinion and Order).

5. Comments on Bell's January 22, 1976 proposals for changes to the technical standards were timely filed by GTE, Rixon, IBM, NATA, CCL, IDCMA, CBEMA, Exxon, Phone Mate, Inc., Ford Industries, International Telephone and Telegraph Corp. (ITT), and Rollins Protective Services Company.[2] Bell replied to these comments on March 1, 1976.[3]

6. In reaching its decision herein, the Commission has carefully considered all the pleadings listed in paragraph 2 above, as well as Bell's January 22, 1976 filing and the responsive pleadings listed in paragraph 5 above. This Memorandum Opinion and Order will address these pleadings only insofar as they address the technical standards contained in Subpart D (and certain related definitions) of Part 68 of the Commission's Rules. To the extent that the various pleadings address any other matters—which were ruled upon in our February 13, 1976 Memorandum Opinion and Order—such matters will not be addressed again.

Section 68.302 *Environment Simulation*

7. *Vibration.* Bell has proposed substantial changes to our environmental simulation requirements. These requirements are intended to simulate various stresses to which registered terminal equipment and registered protective circuitry may be subjected during shipment and usage, 56 FCC 2d at 603. In proposed revisions to Section 68.302(a) Bell recommends reducing the vibration requirements from the present specified levels to levels which more accurately reflect the environment which the equipment will experience. Specifically, Bell recommends that the rule require conformance while the equipment is in the condition in which it

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[2] Late-filed comments were also received from the Office of Telecommunications, U.S. Department of Commerce; United States Independent Telephone Association (USITA); and T.A.D. Avanti, Inc.

[3] Bell was granted an extension of time by the Chief, Common Carrier Bureau.

is normally shipped or transported, based on its belief, which is supported in referenced publications, that the vibrations incurred in shipment are usually orders of magnitude higher than the peak levels experienced while in service, and its conclusion that the vibration environment to which the equipment is exposed during shipment is controlling. Ford Industries, CCL and IDCMA agree that Bell's proposed changes to Section 68.302(a) are reasonable; GTE wishes that such requirements be stated in terms of displacement, rather than the more usual "g-force" parameters which are normally used in vibration testing; and NATA views the less stringent proposal as applicable to larger-sized PBX and key system equipment as unsuitable, and requests that the Commission retain the present, more stringent, requirements.[4] Bell's rationale, and the listed references upon which it is predicated convince us that it is appropriate to accept the Bell-proposed Section 68.302(a) rule change in its entirety.

8. *Temperature and Humidity.* GTE proposes complex changes to the temperature and humidity requirements of Section 68.302(b). In its Petition for Reconsideration, filed December 8, 1975, GTE recommended that temperature and humidity requirements and tests from the Rural Electrification Administration Specification Document PE-41 be substituted for Section 68.302(b). In its comments on Bell's January 22, 1976 filing, which did not address the present Section 68.302(b) requirements (and therefore, presumably accepted them), GTE recommends that tests incorporating environmental specifications which have been utilized by GTE Automatic Electric Laboratories, Inc. "in evaluating the devices offered by the GTE companies" be adopted. These latter specifications are based on military procurement specifications, MIL SPECS. Nos. MIL-STD-202, MIL-STD-750 and MIL-STD-883. Aside from the fact that the new GTE recommendation is unauthorized under a pro-

[4] As the present scope of the program is not applicable to such equipment, NATA's comment is irrelevant at this time.

cedure which allowed comment on Bell's January 22, 1976 filing, and thereby did not allow other parties to the proceeding opportunity to comment thereupon, it appears to be inconsistent with GTE's own earlier recommendation.

9. We would note that the REA specifications, military procurement specifications, and GTE's own acceptance testing are directed at a somewhat different objective than the FCC's registration program. In each of these cases, the testing is designed to assure that equipment will operate properly if subjected to such testing. Moreover, these specifications are generally of the "accelerated life" variety which purposefully subject equipment under test to more stringent stresses than are expected to be encountered, to "shake out" production units of marginal performance. Our approach has been to accept Bell's judgment that Section 68.302(b) will adequately "shake out" telephone equipment which will be harmful. The temperature and humidity requirements were drawn from specifications imposed on conferencing devices and APCM devices, both of which have, for some time, been exempt (under the interstate tariffs at issue in this proceeding) from the requirement of a telephone company-provided connecting arrangement, if appropriately authorized.[5] It should be noted that the GTE telephone companies have concurred in the interstate tariff provisions which have permitted attested conferencing devices and conformed telephone answering devices to be directly connected with the telephone network. In the absence of a demonstration that these specifications have been inadequate in the past, we must reject any new proposal for more stringent temperature and humidity specifications than are presently contained in the rules.

10. *Shock.* Bell proposes substantial changes to Section 68.302(c), shock requirements, which are intended to set forth a program which takes into account the various weights and service uses of different equipment. First, Bell

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[5] *See* 56 FCC 2d at 603-04.

recommends shock tests for equipment packaged for shipment, which are intended to simulate expected stresses which occur when the packaged equipment is being handled and experiences accidental dropping on a loading platform, or when it is thrown into contact with a hard, unyielding surface. Then, Bell recommends additional unpackaged tests which are intended to simulate stresses which are reasonably expected during equipment handling, installation and normal usage.

11. Our stated objective in promulgating shock test requirements was to require that harm does not arise as a consequence of stresses which registered equipment will be subject to during shipment and usage. Bell's recommended changes to Section 68.302(c) are consistent with that objective, as Bell's rationale and the references stated therein indicate. GTE and IDCMA support Bell's recommended change, while NATA recommends that Bell's proposal be rejected and the present rule be retained, on the theory that the revised standards are unreasonably stringent for PBX and key telephone systems.[6] In view of the foregoing, we are adopting Bell's proposed Section 68.302(c) in its entirety.

12. *Metallic Voltage Surge.* In its January 22, 1976 filing, Bell proposed changes to Section 68.302(d), metallic voltage surge requirements, the purpose of which was to impose somewhat less stringent parameters than are presently contained in that section, which Bell explained are more representative of metallic surges which are likely to occur.[7] In

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[6] As we have already noted, such comment is irrelevant at this time. We would note, however, that many of the new shock test parameters are less stringent as applied to large equipment, such as PBX and key telephone systems, than are the present requirements of Section 68.302(c).

[7] In support, Bell cited two technical publications: D. W. Bode and P. A. Gresh, *Lightning Surges in Paired Telephone Cable Facilities*, 40 Bell System Technical Journal at 547-76 (March, 1961); and E. Benneson, A. J. Ghazi, P. Ferland,

addition, Bell sought clarification of the meaning of the sub-section by introducing a requirement of compliance when the specified surges are applied with a power source having a peak current capability of 100 amperes. GTE asserts that the proposed requirements are inadequate and recommends that the present values be retained.[8] NATA, T.A.D. Avanti, IDCMA, Rixon and Phone-Mate, Inc. all accepted Bell's recommendation, but both IDCMA and Rixon wished the resulting rule to be further clarified to indicate how such surges are to be applied to equipment (e.g., in all operational states, all normal states of connection to telephone facilities, with artificial connections made to assure test modes which may only arise under certain failure conditions, etc.).

13. Bell's March 1, 1976 Reply responds to the position of IDCMA and Rixon that the suggested rule change left the actual test requirements ambiguous, by requiring compliance (1) in any operational state which can affect compliance with the requirements of Part 68, and (2) any state in which the equipment might be connected to the telephone network and from which it is capable of transferring to an operational state through action required for the proper use of the equipment, provided that any such state can affect compliance with the requirements of Part 68. It is further proposed that the rule be changed to state "During application of the surges, equipment states which cannot be achieved by normal means of powering shall be achieved artificially by appropriate means." Finally, Bell suggests language which indicates that "fail-safe" testing is what is required; that is, that equipment can be placed in an operational failure mode by the testing so long as, in failing, it

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Lightning Surges in Open Wire, Coaxial and Paired Cable, Institute of Electrical and Electronics Engineers (IEEE) International Conference on Communications, June 1972 (the second reference reports the results of field measurements performed by Bell-Northern Research (Canada)).

[8] GTE cites the same two technical publications as Bell but reaches different conclusions therefrom.

continues to comply with the limitations of Sections 68.304 *et. seq.* in Subpart D or Part 68.

14. In addition, Bell responds to GTE's claims that the parameters should not be made less stringent by indicating that the Bell-proposed parameters are more representative of surges which are likely to occur and are therefore more appropriate. In view of Bell's broad experience with its nationwide telephone network facilities, we shall accept its basic conclusion that the newly-specified parameters are adequate to assure that the telephone network will be protected from harm. Consistent with our view that equipment shall conform to the limitations of Sections 68.304 through 68.314 under the application of foreseeable stresses, such as metallic surges, we shall adopt Bell's revised language with an additional clarification that a reasonably foreseeable state of connection of equipment to the telephone network is one where the commercial power connections are not made (e.g., a power cord has been withdrawn from a wall outlet), but the equipment is connected to the telephone network.

15. *Longitudinal Voltage Surge.* In its January 22, 1976 filing, Bell proposed changes to Section 68.302(e), longitudinal voltage surge requirements, the purpose of which was to impose somewhat less stringent paramaters than are presently contained in that sub-section. Bell explained that the present requirement is representative of surges that occur only under very unusual conditions, and even then only infrequently. However, Bell sought retention of the present requirement, with waveshape modification, as applied between the phase and neutral terminals of the ac power line connections. IDCMA, Rixon, T.A.D. Avanti and NATA support the changes, although, as in the case of metallic surge requirements, both IDCMA and Rixon wished clarification of how such surges are to be applied to equipment. GTE agrees in part with the Bell proposal, but seeks retention of what it feels are the present waveshape specifications as applied to phase and neutral ac power line

connections.[9] GTE cites the references and conclusions reached with regard to retaining the present metallic surges requirements as supporting its position with regard to longitudinal surges.

16. In its March 1, 1976 Reply, Bell responds to IDCMA and Rixon's position that the suggested rule changes left the actual test requirement ambiguous in a manner similar to its response to the analogous problem in the case of metallic surges. Also, Bell again responds to GTE's position (that the requirements should not be made less stringent) by reaffirming its belief that the specified parameters are representative of surges which are likely to occur. With the same caveat which we stated in regard to metallic surge requirements, we are adopting Bell's revised language.[10]

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[9] The present rule requires 2500 volt peak surges of 2 microsecond rise time to crest and 50 microsecond decay time to half crest. Bell proposes splitting the requirement to a severe test between the phase and neutral power connections (2500 volts, 2 microsecond rise time to crest and 10 microsecond decay time to half crest), and a less severe test between all other sets of connections (1500 volts, 10 microsecond rise time to crest and 160 microsecond decay time to half crest). GTE agrees with splitting the requirement into two sets, but wishes the decay time for the more stringent 2500 volts test "be retained" at 1000 microseconds, which, in fact, is *more* severe than the present requirement of 50 microseconds.

[10] IDCMA also raised the point that Bell's January 22, 1976 proposal required expensive test equipment with a specified peak current capability. Bell's March 1, 1976 language now specifies that "the peak current drawn from the surge generator must not be limited to less than 200 amperes by the capabilities of the surge generator." Clearly, since the revised language specifies "peak current," energy storage devices (such as capacitors with appropriate equivalent series impedance) could be charged to the specified voltages by power supplies of far less current capability than the specified 200 amperes and be used as part of the surge generator apparatus, if when discharged the resulting surge voltage conformed to the waveform specifications. In view of this, we feel that IDCMA's concerns have been met.

17. Related to the requirements of Sections 68.302(e) and 68.304 are Bell's proposed new definitions of "power connections" and "non-hazardous voltages." In its January 22, 1976 recommendations, Bell proposed that "power connections" be defined as the connections between commercial (primary) power and any transformer, power supply, rectifier, converter or other circuitry associated with registered terminal equipment. Then, Bell removed from this definition, conductors which distribute "non-hazardous power" *to* registered terminal equipment, or which distribute *any* power *within* registered terminal equipment. Finally, Bell sought (within the definition) to exempt Underwriters' Laboratory (UL) approved power sources, with open-circuit potentials below levels specified in a related definition, from a requirement of FCC registration. IDCMA notes that a simpler definition of "power connections" would be "the connections between commercial power and registered terminal equipment" but does not otherwise disagree with the proposed language. Phone-Mate, Inc. accepts the UL approval requirements, but NATA wishes such requirements to be in the alternative, i.e., either FCC approval or UL approval of power sources should be required.

18. In its March 1, 1976 Reply, Bell changes the definition of "power connections" somewhat to bring connections between registered protective circuitry and non-hazardous power, and conductors which distribute any power within registered protective circuitry into the exclusion, and to indicate that "green wire ground" (the grounded conductor in a three-conductor commercial power circuit) is not a power connection. Finally, Bell agrees with NATA's comment that either FCC approval or UL approval of non-hazardous power sources would be appropriate.

19. We agree with Bell's premise that a power source which has already reliably been evaluated by a laboratory such as UL to standards as stringent as ours need not be additionally evaluated by us. We feel that this result has

already been reached by the rules, as our registration requirement is that compliance with the limitations in Sections 68.304 and 68.306 (under certain stresses) be demonstrated. If UL, or any other laboratory, has performed tests which directly or inherently demonstrate compliance with our rules, then the results of such testing, in summary form, could be included as an exhibit in a registration application. As a practical matter, however, this approach does require FCC registration in addition to UL approval prior to the use of a non-hazardous power source. We are somewhat troubled that UL does not have an approval standard that is directly related to approval of non-hazardous power sources, although several UL standards incorporate such requirements. Until such time (if ever) that UL adopts a specific standard applicable to non-hazardous power sources, which we can incorporate by reference in our rules, we shall adopt the following requirement: connections between registered terminal equipment or registered protective circuitry and sources of non-hazardous voltage will be deemed as not being power connections if each such UL approved source of non-hazardous voltage which reasonably can be expected to be used with the registered terminal equipment or registered protective circuitry is identified in the application for registration of the terminal equipment or protective circuitry, and the UL standard number, and sections thereof to which such power source conforms which demonstrate compliance of the power source with Sections 68.304 and 68.306 of the rules are also listed. Each listed UL-approved power source will be listed in a grant of registration, and the registration grant will be conditioned upon the use of one of the listed power sources. In accordance with the foregoing, we are adopting AT&T's proposed definition of "power connections," we are modifying our Section 68.306 rules to accommodate non-hazardous voltage sources.[11]

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[11] We are slightly modifying the "power connection" definition to use the term "source of non-hazardous voltage."

Section 68.304 *Leakage Current Limitations*

20. In its January 22, 1976 filing, Bell proposed several changes to Section 68.304, leakage current limitations, which generally have the effect of making the requirements less stringent. Related thereto are proposed definitions of "power connections" (previously addressed), and "telephone connections." GTE, ITT, NATA, T.A.D. Avanti and IDCMA endorse the proposed changes, although IDCMA wishes further clarification, as in the case of surge requirements, of the requisite test procedures. Rixon wishes all leakage current limitations to be specified under the application of only 1000 volts, and cites certain UL standards as supporting its claim that 1000 volt rms testing is an adequate test of barriers designed to protect personnel from exposure to commercial power sources of 250 volts or less. Upon examination of one of the cited UL standards[12] we find that the dielectric breakdown specifications therein require 1000, 1500 and 2500 volt testing for equipment connected with power potentials less than 250 volts, and therefore conclude that Rixon's premise is erroneous.

21. Specifically, Bell proposed following our general approach of requiring adequate insulation between the telephone connections, power connections and exterior conductive surfaces, but clarified this requirement by separately listing connections to non-registered equipment (on the theory that connections to registered equipment will adequately be protected by such equipment itself conforming to the leakage current requirements). Bell then proposed lowering the test voltage required between the telephone connections and exposed conductive surfaces, and the telephone connections and connections to non-registered equipment, from its present level of 1500 volts rms to 1000 volts rms. Finally, Bell proposed changing the current limitation from 2.5 ma. rms to 10 ma. peak (about 3 times higher for

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[12] UL 114, ANSI X4.12-1970, dated October 9, 1970, Section 301, pp. 74-75.

sinusoidal signals) under the application of the specified voltages.

22. In its March 1, 1976 Reply, Bell clarifies its proposal by indicating that voltages should be applied to combinations of (1) telephone connections, (2) power connections, (3) exposed conductive surfaces on the exterior of such equipment, and (4) terminals for connection to non-registered equipment and points having a conducting path to the secondaries of any power supply. Bell responds to IDCMA's concerns about the requisite test procedures by requiring conformance in "all appropriate states of the equipment which could affect compliance" with the technical requirements of Part 68 of the Rules.

23. We are of the view that Bell's revised proposed language, in the main, adequately responds to the concerns of various parties and to the concerns which we expressed in the First Report and Order. However, we are somewhat troubled by the introduction of "points having a conducting path to the secondaries of any power supply" into the fourth category, as leakage current is required to be limited both between telephone connections and the fourth category, and between primary power connections and the fourth category. We would agree that a primary-to-secondary leakage current limitation under the application of 1500 volts is a reasonable requirement. In view of our disposition of Bell's suggested language accommodating non-hazardous voltage sources, *supra*, the requirement of demonstrating primary-to-secondary leakage current limitation in such sources becomes quite important. But, given that conformance to this requirement is demonstrated, there is no additional need for a secondary-to-telephone connection barrier, as the relevant concern which we expressed in the First Report and Order is that the telephone connections must be adequately isolated from primary power connections. If that isolation is demonstrated by primary-to-secondary leakage testing, no additional isolation is required. *See* 56 F.C.C. 2d at 605. In light of the foregoing, we are establishing a fifth

category—points having a conducting path to the secondaries of any power supply—and adding a requirement to the voltage table which specifies 1500 volts between points (2) and (5).

Section 68.306 *Hazardous Voltage Limitations*

24. In its January 22, 1976 filing, Bell proposed breaking hazardous voltage limitations into normal modes and failure modes (the present Section 68.306 requirement speaks only of failure modes). Under its proposed normal mode language, voltages applied to the telephone network other than intentional network control signals and supervision signals are limited by the Section 68.308 signal power requirements. This is consistent with our discussion of hazardous voltage requirements in the First Report and Order, 56 F.C.C. 2d at 606. Under its proposed failure mode language, Bell specifies an all-inclusive limitation of 70 volts peak after the first second, applied to a simulation of the resistance of a human body connected with the telephone connections, as being the failure mode voltage limit. Bell further proposes that a worst-case failure of equipment connected with registered protective circuitry be simulated by applying 300 volts rms to the circuitry, rather than the presently-specified 220 volts rms.

25. T.A.D. Avanti, Rixon, NATA and GTE concur in the revised language, although Rixon wishes clarification that testing may be destructive, and GTE wishes the additional words "and currents" added to the section. IDCMA, on the other hand, supports the present wording of Section 68.306 and feels that the proposed revision provides no additional protection, and contains vague standards which could not effectively be administered.

26. In view of the fact that, other than during network control signaling and supervision, voltages which would be applied to the telephone network are limited by the signal power requirements of Section 68.308, and are on the order of one volt rms, we agree that it is rational to distinguish

between normal and failure mode requirements in this rule. In its proposal, Bell incorporates a rather vague "consistent with the standards generally employed by the telephone companies" standard for the intentional (much higher) voltages associated with network control signaling and supervision. Consistent with the views expressed in our First Report and Order, 56 F.C.C. 2d at 602 (paragraph 22), that network control signaling compatibility can be assured by the provision of informational materials to equipment manufacturers by the carriers, we would expect that the "standards generally employed" will be thereby manifested to equipment manufacturers, which would obviate the problems which are posed by Bell's vague language.[13] Since Section 68.110(a) imposes an obligation on the telephone companies to provide information of this sort, we do not feel it necessary to change Bell's proposed language herein to remove this vagueness.

27. With intentional network control signals expected from the requirements of the section, there is no longer any reason to specify the voltage limitations as high as 135 volts dc and 140 volts peak for combined ac and dc, as these limitations are consistent with the network control signals used on certain telephone facilities. Therefore, AT&T's proposed reduction of the voltage limitation to 70 volts peak is appropriate, as it limits the possible prevalence of higher voltages on the telephone network to only those cases where it actually is necessary for network operation.[14]

28. In its March 1 response, Bell meets IDCMA's objections by indicating that only *one* unit is to be tested, in

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[13] Bell states that such standards will be made available by the telephone companies upon request.

[14] As was indicated in the First Report and Order, 56 F.C.C. 2d at 606-07, the higher levels which we originally specified are acceptable in the telephone industry. However, where possible, it is consistent with good engineering practice to limit voltages to lower levels than those which are considered hazardous.

accordance with its recommended requirement of protection against hazardous voltages as they may arise on connections to unregistered equipment, recognizing that such testing may be destructive. We are somewhat similarly revising the requirement of demonstrating that registered protective circuitry will adequately provide a barrier to hazardous voltages by requiring that at least *two* units be tested, one at 120 volts rms and one at 300 volts rms. This dual requirement is predicated on the belief that testing at 300 volts may stress components into a hazardous voltage-protective open circuit condition which they may not be stressed into upon the application of the more probable power cross with 120 volts rms. Therefore, we are requiring testing at both voltage levels.

29. Finally, consistent with our discussion of non-hazardous power sources (see paragraphs 17-19 above), we are setting forth separate requirements for the registration of such power sources. As was previously discussed, compliance with this requirement (and the therein-referenced environmental conditioning and leakage current requirements) may be demonstrated by the results of testing by a laboratory such as Underwriters' Laboratory if it is also demonstrated that such testing assures compliance with our requirements. Accordingly, we are adopting Bell's revised Section 68.306 language substantially in its entirety.

Section 68.308 *Signal Power Limitations*

30. *Loop simulator definition.* Inasmuch as the present signal power limitations are predicated on equipment performance measurable as connected with a loop simulator circuit (as well as longitudinal balance requirements), we shall address the loop simulator first. The loop simulator is intended to simulate the telephone network in such a manner that equipment may be connected to such a circuit for evaluation. The Commission had specified both a range of dc current, and an impedance for the loop simulator, both of which were intended to be fairly representative of the

telephone network as viewed by terminal equipment and protective circuitry connected thereto. Comments received seeking reconsideration indicated that there has been some confusion about the meaning of the Commission's language, and Bell accordingly suggests clarification by providing a definition which includes a schematic diagram of a typical loop simulator circuit. Additionally, Bell suggests that the impedance of the loop simulator, presently specified as 900 ohms in series with 2.14 microfarads, be changed to 600 ohms, resistive.

31. USITA comments that the suggested range of possible variation of loop resistance in the circuit should be increased above AT&T's recommended 200 ohms maximum to accommodate simulation of long loops. The Department of Commerce wishes tests to be performed both at the previously-specified impedance of essentially 900 ohms and at the newly-specified impedance of 600 ohms, on the theory that 900 ohms is more representative of long loops. We agree with Bell's response that its recommended circuit already accommodates long loops with regard to the purpose of establishing signal power and longitudinal balance limitations under Part 68 of the Rules. Accordingly, we are adopting Bell's definition of a loop simulator circuit.

32. *Power limitations.* Rather than reciting each issue raised in the various comments which relate to signal power limitations, we shall discuss Bell's revised Section 68.308 language, as contained in its March 1, 1976 filing, in light of the major concerns which were voiced, and in light of the First Report and Order.[15] Basically, Bell separates requirements on equipment which itself generates signal power, from requirements on equipment which passes signal power generated by other equipment connected thereto. It also sub-divides signal power limitations into those related to live voice signals (where there is statistical assurance of not

[15] This approach is adopted for clarity in this decision; of course, all comments were carefully considered in reaching the result herein.

exceeding the power limitations through the normal characteristics of human conversation), those related to voice equipment not generating live voice signals, those related to equipment containing internal network control signaling power sources, and those related to data equipment. Bell then recommends requirements on out-of-band energy (which are presently required by the interstate tariffs) where such requirements can easily be met by the equipment under test, without thereby incorporating a filtering requirement.[16] Finally, Bell recommends limitations on longitudinal voltage except during network control signaling; these additional limitations are required because the rules do not necessarily impose a requirement of a transformer in the voiceband path (which was used in the connecting arrangements, in part, to prevent the application of virtually all longitudinal voltage to the network), and absent a specific requirement of a transformer, longitudinal voltage must otherwise be controlled through the registration process.

33. There is no voiceband power limitation imposed on terminal equipment used for live voice signals, on the theory that the normal conversation mechanisms will adequately control such power (as has been the case in telephone set to telephone set communications on the network in the past). However, terminal equipment used for live voice signals is subject to out-of-band signal power limitations under the application of an *acoustical* input signal (applied to its microphone).

34. Voice terminal equipment and protective circuitry which contains signal power sources primarily intended for

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[16] This was in response to comments on Bell's January 22, 1976 proposal which could have been interpreted as requiring low-pass filtering. Such filtering has never been required, or performed, in the functionally-equivalent connecting arrangements used since 1969; rather, the telephone companies have relied upon prohibitory language in the tariffs, and information distributed to equipment manufacturers to (successfully) prevent out-of-band energy problems from arising.

network control signaling is required to limit such signal power sources (in normal operation) to one milliwatt averaged over any 3 second interval.[17]

35. Terminal equipment and protective circuitry which is connected to the telephone network at one port, but which has provision for through transmission of signal power from other equipment is required to provide essentially unity (or less) gain, which thereby assures that registration of equipment connected thereto will not be upset by gain in such a device.

36. *Out-of-band signal power.* Signal power above 3995 Hertz poses a problem of potential interference with telephone service. Since 1969, the telephone companies have employed connecting arrangements which pass energy above 3995 Hertz, and which do not employ components which specifically limit such energy (filters). Rather than employing "hardware" protection in the connecting arrangements, the telephone companies have used informational materials distributed to equipment manufacturers ("Technical References") as a means of informing such manufacturers to design equipment which does not generate out-of-band signals. In addition, there have been tariff provisions which specify the out-of-band signal limitations, and which could have been used to justify discontinuance of service to telephone subscribers using equipment which, in fact, did generate out-of-band energy in excess of the stated limits. No evidence has been presented of interference with telephone service as a consequence of the telephone companies' decision to not include specific hardware protection against out-of-band signal power.

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[17] The "normal operation" requirement is intended to cover the statistically unlikely case of a telephone subscriber depressing a TOUCHTONE® button for more than 3 seconds (such signals may well exceed one milliwatt) and not impose a requirement of signal power limiting components because of this possibility.

37. When Bell proposed, in its January 22, 1976 filing, to introduce out-of-band energy limitations, IBM and CBEMA commented that since there has been no protection against out-of-band energy in the past, there is no need to introduce such protection now in the FCC registration program. This somewhat misstates what has occurred in the past. It is true that the connecting arrangements do not contain specific components which limit out-of-band energy (filters), but they are sufficiently linear devices, in their through-transmission signal path, so as not to generate out-of-band energy through harmonic distortion.[18] In its March 1, 1976 filing, Bell responds to these criticisms by adopting what we feel is a rational approach.

38. Equipment which itself generates signals is required to conform to the out-of-band power limitations. This can easily be measured, and imposes no design requirements in addition to those already imposed since 1969. Equipment which provides a through transmission path for electrical or acoustic signal power is required not to generate harmonics of a 1000 Hertz input signal which violate the out-of-band power limitations (essentially, a linearity specification). This also can easily be measured, and continues the present effect of the telephone companies' sufficiently linear designs of their connecting arrangements. The specific requirements on signal power in the 3995 to 4005 Hertz band are variations on the afore-stated theme. Here, for equipment with a through transmission path, the attentuation in that path becomes important; the attenuation in the through transmission path between 600 and 4000 Hertz is required not to exceed by more than 3 dB the attenuation in that path at any frequency between 3995 and

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[18] Non-linearity in a through transmission path can generate frequency components at integral multiples of frequencies at the input of the path; thus, signals with no components above 3995 Hertz, at the input of a non-linear transmission path could emerge with frequency components *above* 3995 Hertz, and, if of sufficient amplitude, these *generated* components could violate the out-of-band energy limitations.

4005 Hertz. And again, for equipment which itself generates signal power (other than network control signaling), the requirement is that the equipment itself not generate power in the 3995 to 4005 Hertz band above a level 18 dB below the maximum permitted power in the voiceband.

39. *Data Equipment.* For the reasons discussed in the First Report and Order, 56 F.C.C. 2d at 607-09, we sought to provide assurance of data equipment compliance to both controlling specifications on voice-band signal power (pending the outcome of Docket No. 19419): a one milliwatt limitation measurable at the terminal equipment locations, and a 12 dB lower limitation measurable at the telephone company central office, both averaged over any 3-second time interval. As the various comments on signal power limitations for data equipment (and related comments on plug/jack requirements for data equipment) have pointed out, there are actually *three* techniques which will appropriately assure compliance with the two controlling specifications. These are *first*, a programmed signal power level (implemented through the use of a programmable data jack and plug, as discussed in the First Report and Order); *second*, an attenuated fixed level output (implemented through the use of jacks which incorporate attenuators to limit a fixed output level to a level which produces a −12 dBm signal power at the telephone company central office); and *third*, a fixed level output, sufficiently low in amplitude to be able to be used on substantially all connections with the telephone network.

40. As revised by its March 1, 1976 Reply, Bell proposes that the levels to which equipment is capable of being limited by the programmable data jack connections, to implement the first technique listed above, be programmed in 1 dB steps from −12 dB to −3 dB with respect to one milliwatt, as delivered to a loop simulator circuit; that the attenuated fixed level output be specified as no greater than −4 dB with respect to one milliwatt; and that the fixed level

output usable on substantially all telephone network connections be no greater than −9 dB with respect to one milliwatt. Manufacturing tolerances are permitted for individual units of equipment which have the effect of increasing the signal power levels in the first two of the above-specified cases by as much as 1.0 dB, provided that the signal power levels averaged overall production units are within the specified limits. However, in the third case above (the fixed level output usable on substantially all telephone network connections), manufacturing tolerances are not permitted, which would permit the −9 dB with respect to one milliwatt maximum to be exceeded.

41. We accept Bell's revised recommendations with regard to signal power limitations in all categories as reflective of the concerns manifested in the comments which we have received and of our own views as expressed in the First Report and Order, and shall adopt Bell's March 1, 1976 proposed language. We would note one caveat, at this point, to data equipment manufacturers, which will not appear in our rules. Since the mean attenuation of telephone loops is on the order of 3 dB, using the −9 dBm fixed signal power output level of universal applicability should, in the mean case, result in the maximum permitted signal power. However, many loops have greater attenuation than the mean level; therefore, in such loops, less than the permitted signal power level will result at the telephone company central office. This is consistent with the intent of the rules, as a manufacturer has the choice of optimizing the performance of data equipment by choosing to use a programmable plug/jack arrangement. An equipment manufacturer who chooses to use the −9 dBm fixed level means of connecting with universal voice jacks (e.g., portable data equipment such as facsimile equipment) is assuming the risk of non-optimal performance due to excessive attenuation on any given connection. Equipment designed in this environment should be designed accordingly.

Section 68.310 *Longitudinal Balance Limitations*

42. In its January 22, 1976 filing, Bell proposed relaxation of the present longitudinal balance requirements, coupled with a related redefinition of "longitudinal balance." Basically, Bell has differentiated the metallic-to-longitudinal balance coefficient, which relates to the probability that unbalanced equipment will *cause interference to* other telephone network users, from the present definition, which is a longitudinal-to-metallic balance coefficient, and which relates to the probability that the unbalanced equipment itself will be *interfered with*.[19] Since the metallic-to-longitudinal balance coefficient is relevant to the definition of harm contained in the rules, and the latter is not, Bell proposes substitution of this definition. We agree.

43. In its March 1, 1976 filing, in response to several comments on recommended test apparatus and on the specific parametric limits for longitudinal balance (as redefined), Bell presents a unified set of balance limitations for various equipment types, and for on-hook and off-hook states. With the exception of equipment used in conjunction with ground-start trunks (which in the quiescent state has circuitry connected with earth ground), all on-hook requirements are for 60 dB of balance in the 200 to 1000 Hertz frequency range. Off-hook balance is required to be greater than 60 dB between 200 and 1000 Hertz, and 40 dB between 1000 and 4000 Hertz for *voice* equipment, and 40 dB in this entire band (200 to 4000 Hertz) for *data* equipment. The reason for the 20 dB discrepancy in the 200 to 1000 Hertz band is that most voice power is concentrated below 1000 Hertz, whereas data equipment, if efficiently using the voiceband spectrum, more uniformly distributes signal power over the entire 200 to

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[19] It should be noted that the present definition of the longitudinal-to-metallic coefficient was drawn from a Bell specification and from the results of the F.C.C. advisory committees. *See* 56 F.C.C. 2d at 608-09.

4000 Hertz band.[20] Since the bulk of the voiceband power is in the 200 to 1000 Hertz band, a higher degree of balance is required to limit the expected interfering signals in other communications channels to the same levels as they are limited in the data specification, which will have lower driving signals in the same band.

44. A significant change from the present requirements of Section 68.310 is that the balance requirements, under Bell's proposed language, accommodate ground-start trunks, which use the intentional connections of the communications path with earth ground during certain signaling states, but not when actual voiceband energy is present.

45. We feel that Bell has presented a reasonable approach for the establishment of appropriate longitudinal balance requirements, which adequately responds to all comments which we have received on Section 68.310, and accordingly, we are adopting Bell's proposed language, as discussed above, for this rule, and for a related definition of "equipment port."

46. A related matter has come to our attention (during cooperative carrier-industry meetings on standardization of jack/plug designs) which we will address at this time. The scope of Part 68 clearly includes all ancillary equipment. Presently-available ancillary equipment falls generally into two categories—equipment which is connected in parallel with telephone facilities, and equipment which is connected in series with telephone facilities (interposed between the telephone network and other equipment, which may be customer-provided or telephone company-provided). The language of Section 68.104(a) is intended to accom-

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[20] *See* D. H. Hamsher, *Communication System Engineering Handbook* (McGraw-Hill, 1967) pp. 3-3 and 3-4 reproducing average speech spectra from N. R. French and J. C. Steinberg, *Factors Governing the Intelligibility of Speech Sounds*, Journal of the Acoustical Society of America, Volume 19, pp. 90-119 (1947).

modate series, or interposed connection, of ancillary equipment as it requires arrangement of a jack so that "if the plug connected thereto is withdrawn, no interference to the operation of equipment at the customer's premises which remains connected to the telephone network, shall occur by reason of such withdrawal." 56 F.C.C. 2d at 616. Thus, where a plug connected to a series jack is withdrawn, the jack is required to provide continuity which would permit the equipment with which ancillary equipment is operating to continue to operate.

47. A fundamental problem which surfaced at the plug/jack meetings was that the longitudinal balance limitations are predicated upon parallel connection of equipment. Where a series impedance is interposed on *one* telephone connection wire (e.g., tip or ring), that impedance upsets the longitudinal balance of the equipment with which it is in series, as perceived by the telephone network, although this equipment's balance, without an interposed series connection, is within the limits of Section 68.310. Additionally, the series connection may upset the net balance as perceived by the telephone network, through its capacitive coupling of one telephone connection wire to earth ground (which might be overcome by including a connection with the other telephone connection in a common cable to the series-connected equipment, in which case similar coupling characteristics to earth ground for both line wires might occur). Our dialer committee addressed this problem in the case of dialers, which are placed in series with one telephone line wire, by requiring the dialers to present less than one ohm of impedance when the telephone set associated therewith is in use for voice communications, and by requiring that the impedance between the interface leads and earth ground exceed certain defined limits (which thereby addressed the capacitive coupling problem). We are of the view that the limits of Section 68.310 adequately address the desired result which should be reached if the longitudinal balance of the combination of interposed equipment and other equip-

ment is measured, as presented to the telephone network. Based upon information in our files, the balance of a standard telephone set is on the order of the value specified in the First Report and Order, i.e. [120-20 $\log_{10}$ (f)]. This is a linear curve, of slope 20 dB/decade, which has values of 74 dB at 200 Hertz and 48 dB at 4000 Hertz, and therefore is *higher* than the limitations which we are adopting herein. In order to register series-connected terminal equipment, a manufacturer should construct a test apparatus which simulates the above-stated balance of a standard telephone set, interpose the series equipment under test through the use of its connecting cord and standard plug, cover the connecting cord between the plug and equipment with conductive foil connected with earth ground, and measure the longitudinal balance of the combination of the equipment under test and the telephone set simulator for conformance to the requirements of Section 68.310. We would entertain petitions for appropriate rule changes which would permit a more direct evaluation of the effects on longitudinal balance of series-connected equipment than we are adopting herein.[21]

Section 68.312 *On-hook Impedance Limitations*

48. The intent of our on-hook impedance limitations, as expressed in the First Report and Order, is to prevent the occurrence of "pre-trip" and "false trip," both of which would be perceived by an unknowing caller as a telephone call which did not go through. As many parties have commented, the requirements of Section 68.312 address 20 and 30 Hertz ringing, but do not address ringing at different frequencies, which ringing is still in use, for single-party telephone service, in many independent telephone companies' areas, although not in the Bell System. In an attempt to set requirements which would be accommodated by the telephone companies' long-standing "ringing

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[21] Bell has indicated that an appropriate petition for rule-making on this matter is being prepared.

bridge" practices, we specified the use of on-hook impedances of standard telephone set ringers.[22]

49. Comments on Section 68.312 generally fall into 3 categories: *first*, some parties comment that we should accommodate "frequency ringing" (i.e., ringing at frequencies other than 20 and 30 Hertz); *second*, some parties comment that our specific requirements as applied to 20 and 30 Hertz ringing are too stringent; and *third*, several parties (AT&T, GTE and Rixon) propose specific revisions which will accommodate frequency ringing. Because these issues have been subject to considerable comment for clarity of discussion we will not recite the specific comments here.[23]

50. In its January 22, 1976 filing, Bell proposes certain conceptual relaxations of our Section 68.312 requirements as applied to 20 and 30 Hertz ringing. Basically, while we had specified that the on-hook impedance of equipment cannot drop below the impedance of a telephone set ringer (that is, yield a Ringer Equivalence Number greater than unity), Bell suggests permitting such lower impedances (with a caveat that high Ringer Equivalence Numbered equipment may not be usable on all connections with the telephone network). In its related proposed definition of "ringer equivalence number," Bell varies our dc resistance requirements to both raise them (for a unit ringer equivalence) and lower them, depending upon applied voltage. Finally, Bell modifies our definition of the ringer impedance, at 20 and 30 Hertz, by substituting 7000 and 5000 ohms, respectively, for the values presently indicated in Figure 1 accompanying Section 68.312 (8000 and 11,000 ohms).

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[22] The telephone companies' installation practices with regard to "ringing bridge" limitations are predicated upon the item of equipment which they install most often—a telephone set.

[23] Of course, we have carefully reviewed all such comments in reaching our results herein.

51. Bell's January 22, 1976 proposal did have one conceptual flaw which was later corrected in its March 1, 1976 filing. The January language imposed limitations related to the entirety of equipment connected with a particular telephone connection. Such requirements were not, on their face, directly translatable into specific registration limitations for any one particular piece of equipment (e.g., dc current and impedance limitations). Our intention was, and is, to establish on-hook requirements to which *individual* pieces of equipment can be evaluated, and then provide a means whereby customers, in consultation with a serving telephone company, can determine whether connection of such equipment is permissible. The mechanism which we established is that of "ringer equivalence" which must appear on the equipment label, and a required dialog with the serving telephone company (during notification). Overlaid on this mechanism is a specific requirement, in Section 68.110, for the telephone company to inform its telephone subscriber, on request, of the "ringer equivalence" limitations of his facilities, which gives the subscriber an opportunity to determine prior to equipment purchase whether it can be connected.

52. GTE and Rixon, in providing positive recommendations for accommodating frequency ringing in the rules, unfortunately did so within the conceptual framework established by Bell's January filing, and therefore set forth proposals on limitations which were similarly related to the entirety of equipment connected with a particular telephone connection. In its March filing, Bell assumed a maximum of 5 ringing bridges, and manipulated its January whole-connection limitations by dividing by 5 to yield per-unit specifications (mainly contained in its proposed definition of "ringer equivalence"). We shall adopt Bell's revised Section 68.312 and related ringer equivalence definitional language as applicable to "type A" (20 and 30 Hertz) ringing. We shall similarly manipulate, by the factor of 5, GTE's proposed requirements as applicable to

types "C" through "N" ringing. For type "B" circuitry (broadband), we shall define the "ringer equivalence" as the worst-case of all of the limitations imposed upon all of the other ringing frequencies. If the resulting standards are not acceptable to some, or all of the independent telephone companies which utilize ringing standards and techniques other than 20 and 30 Hertz ringing, as is used by Bell, we encourage such companies (or their trade associations) to file appropriate petitions for rulemaking; any such petitions will be acted upon expeditiously.[24]

53. One final related matter is the introduction of a maximum on-hook impedance specification of 40 kilohms, in both Bell's and GTE's proposed revisions. The stated rationale for this specification is that unless certain central office facilities are presented with an aggregate impedance, during ringing, below 40 kilohms, automatic fault detection circuitry which is intended to sense fault conditions on the connection will be activated. We appreciate this concern and feel that it is a rational one; however, to impose a maximum impedance specification appears to limit equipment manufacturers from fabricating equipment with ringer equivalence numbers lower than about 0.2, which may limit the use of such equipment on particular connections which already are at the "ringing bridge" maximum. In addition, certain equipment types currently in use presently have no "ringing bridges," as they are intended to be used in conjunction with a telephone set which provides ringing detection.[25] These devices would have

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[24] Such a worst-case Ringer Equivalence may well overstate the ringing load for particular facilities. Such would be a compatibility problem and would *not* cause harm. A telephone company could permit connection of more than 5 equivalent bridges where the numbers are so overstated.

[25] An example of such a device would be the direct-connection analogue of the subject of the *Carterfone* decision—a device which, in conjunction with a telephone set, is used to connect a customer-provided radio system with the telephone network. Such a system is connected in parallel with telephone connec-

an on-hook impedance greater than 40 kilohms (essentially infinite). To accommodate these concerns, we are separating out a category of devices which always will be expected to be connected to telephone connections which already have a maximum impedance of 40 kilohms connected therewith.

54. Bell proposes a new Section 68.107, Responsibility of the User, which in a proposed sub-part (a), in its January 22, 1976 filing, generally requires telephone subscribers to not harm the telephone network, and in a proposed sub-part (b), in its March 1, 1976 filing, requires that telephone subscribers not connect equipment which will cause the ringing bridge limitations of a particular telephone line to be exceeded. Such language may well be appropriate (*see* Section 68.1 "purpose" and 56 FCC 2d at 610, paragraph 47). However, since it relates to the basic rights and responsibilities of telephone carriers and their customers, we feel that this type of requirement is more appropriately contained in the tariffs which define the telephone carrier/telephone subscriber relationship than in our rules. Much of what is proposed for sub-section (a) already is contained in the interstate tariffs at issue in this proceeding; if the telephone companies wish to set forth a requirement related to ringing bridges, such as is proposed in sub-part (b), they may do so in a tariff filing (subject to the normal constraints on such filings). This was the intent of the First Report and Order, and was authorized under the final ordering clause therein, 56 FCC 2d at 614.

Section 68.314 *Minimum Call Duration Requirements*

55. Section 68.314 presently imposes a minimum call duration requirement which is intended, in conjunction with the present requirement of Section 68.308(c), to assure

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tions after network control signaling, including ringing detection, has been performed by an associated telephone set.

that proper network billing is not impeded by data equipment. Several parties have commented that it is ambiguous whether these two sections relate to the same 2-second time interval, or to successive time intervals. In its January 22, 1976 filing, Bell suggested revised language which would meld two requirements together to clarify this identified ambiguity. IBM responded to Bell's January 22 language, by stating its belief that the language would impose signal power limitations for the first 2 seconds on the *call-originating* equipment, and that, in its view, signal power limitations on the *answering* equipment would be adequate. This view is consistent with the Commission's intent in promulgating the stated language of Section 68.308(c). So long as the answering data equipment is effectively precluded from sending a signal to the calling data equipment (—55 dBm is too low a power level to be received), the calling data equipment has no means of assuring that its call was ever answered. We can conceive of no data processing application, polling or otherwise, where calling data equipment would send data and not await *some* reply to indicate that the connection, in fact, had been established. On the other hand, if the calling data equipment is only going to be used to receive data from the called equipment, it would have to await the 2-second interval to do so. Therefore, in both cases, the connection will necessarily be maintained for 2 seconds. The combined effect of the two requirements, presently contained in Sections 68.308(c) and 68.314 is to assure this result, as the registration requirement is that *calling* data equipment is required to maintain the connection for at least 2 seconds. The only way that the calling equipment can comply with this requirement is to know when the connection was established. Even in the extremely unlikely case of an originating dataset configured to send data without some form of data reply from the called dataset, it would not know when the connection had been established either without some form of reply from the called end, or by timing from the end of the last ringing signal tone which

it "heard." Since ringing is typically sent in 2-second-on/3-second-off bursts, sensing of the cessation of ringing would necessarily include at least 2 seconds of connection time. Therefore, for these reasons, we are rejecting Bell's proposed revision of our present Section 68.314 requirements, although we are making certain editorial changes thereto.

56. On the other hand, we feel that there is much merit in placing all billing protection requirements in one unified section of the rules. Therefore, we shall move the present Section 68.308(c) requirement into a revised Section 68.314, which we will caption "Billing Protection," and also will add other billing-protecting requirements, discussed below, to that section.

57. IDCMA has commented that it feels that the 2-second time interval is inappropriate, and that greater than 1.3 seconds would provide the requisite billing protection. Bell responds, in its March 1, 1976 filing, by indicating that the vulnerability associated with the 2-second requirement is presently being phased out on the telephone network, that as its own data equipment is subject to the same limitation it is equally in Bell's interest to lower the time interval as soon as it is feasible to do so, and that at some point in the future it will be feasible to lower this time interval, but for the present, the 2-second limit is what is required. We shall accept Bell's judgment on this point as we agree that there is sufficient motivation here to assure that the 2-second time interval is presently reasonable. Finally, NATA has commented that the time interval should not be applicable to voice equipment. The rules already clearly state that they apply only to "data" equipment and we fail to see how they could be construed as a requirement on voice equipment.

58. *Billing Protection.* In a proposed Section 68.316, Bell seeks rules which will prevent registration of equipment which will have the effect of defeating charging equip-

ment.[26] We are of the view that equipment which is *intentionally* intended to defeat billing will not be the subject of a registration application under Part 68, since merely by filing an application, an applicant would invite investigation and prosecution under various statutes. On the other hand, equipment might be designed which *inadvertently* has the effect of defeating billing equipment. We consider it appropriate to include rules which will prevent registration of equipment in this latter category. We would expect, however, that equipment manufacturers and carriers will be protected against such inadvertent and unintentional equipment design through informational documents concerning compatibility with the telephone network which we have encouraged the carriers to distribute (*see* 56 FCC 2d at 602, para. 22 and note 13 thereto.)

59. In the rationale accompanying its proposed call charging limitation language, AT&T indicates that the specific proposed rules "would deny registration to many of the known [billing-defeating] devices." NATA finds these rules acceptable, but IDCMA and CBEMA comment that tariffs and law already preclude registration of such equipment. IDCMA particularly notes that the third suggested requirement (a limitation on signal power solely in

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[26] Bell also proposed, in its January 9, 1976 filing, allied language which would remove from the scope of the program equipment "which does not have a legitimate telecommunications purpose or which is illegal under the laws of the United States or the laws of any State in the United States." While the stated goal of this language was to deny registration to billing-defeating equipment, as T.A.D. Avanti had indicated in its comments, such language is too vague and subject to wide interpretation. In the unlikely event that a manufacturer of possibly unlawful or fraudulent equipment chooses to surface himself by attempting to register such equipment with the FCC, specific technical requirements, as proposed by Bell, will serve to deny such registration. In any event, the specific "scope" change proposed by AT&T on January 9, 1976 has been rejected in the Commission's February 13, 1976 Memorandum Opinion and Order.

the 2450 to 2750 Hertz band) is presently contained in the telephone companies' tariffs, and Phone-Mate, Inc. notes that it might be interpreted as requiring filtering which has not previously been required by connecting arrangements.

60. Consistent with our view that rules to prevent the registration of equipment which inadvertently has the effect of defeating proper billing are appropriate, we shall adopt Bell's proposed Section 68.316, substantially in its present form, although we shall include it in our revised Section 68.314.

61. As Bell noted, these rules only would serve to deny registration to the "known" billing-defeating designs. Since we have defined "harm," *inter alia*, as "malfunction of telephone company billing equipment," the telephone companies can always petition for appropriate additions to this section should presently-uncontemplated designs arise.

Order

62. In view of the foregoing, IT IS ORDERED, That the petitions for reconsideration listed in paragraph 2 above, and the amendment to Bell's petition for reconsideration (*see* paragraph 3 above) are GRANTED to the extent indicated herein and are DENIED in all other respects.

63. IT IS FURTHER ORDERED, pursuant to Sections 4(i), 4(j), 201-205, 208, 215, 218, 313, 314, 403, 404, 410 and 602 of the Communications Act, That Part 68 of the Commission's Rules and Regulations is amended as shown in the appendix hereto,[27] effective May 1, 1976.

FEDERAL COMMUNICATIONS COMMISSION,
VINCENT J. MULLINS, *Secretary*

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[27] For amendments see Federal Register of March 26, 1976, 41 FR 12665.